

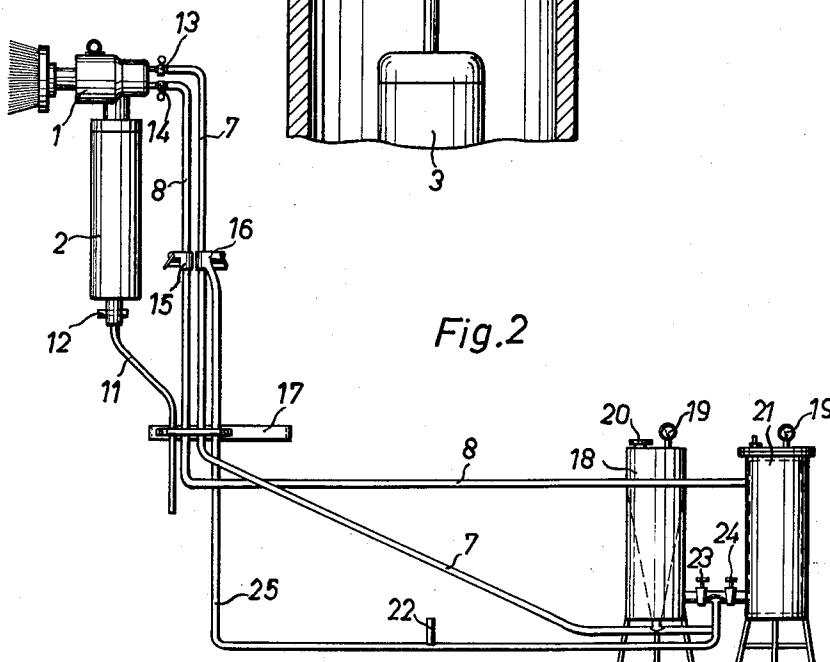
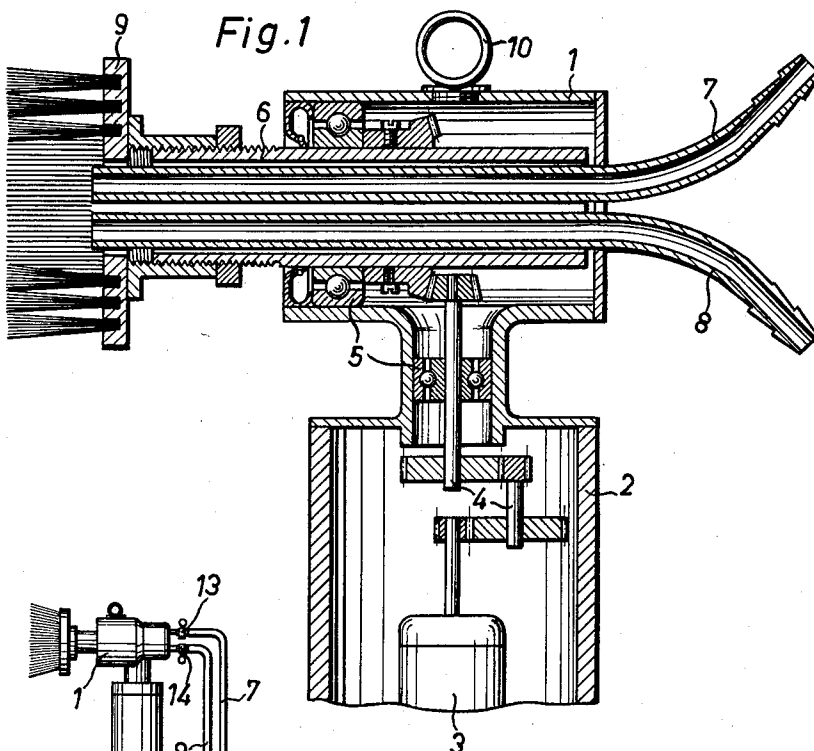
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PAINT-SPRAYING DEVICE WITH ROTATING BRUSH

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PAINT-SPRAYING DEVICE WITH ROTATING BRUSH

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This invention relates to an arrangement by means of which paints, coal-tar colours, and in particular pigments are mechanically applied to the surfaces to be protected and are spread or rubbed thereon in the same operation.

The principle of the invention also includes the fact that the arrangement is made such that the spreading or rubbing movement is effected by means of a brush which rotates around an axis of rotation.

According to the invention, the supply of binder and of the pigment or pigment mixture to the brush is effected by means of a gas subject to excess pressure, for example air.

The binder and the pigment or pigment mixture are supplied separately, the supply points for the two components being situated inside the rotating brush in co-axial relationship to the axis of rotation, while the brush body forms the seal in relation to the external atmosphere. The brush is to a certain extent so shaped that it forms a bell, at the outer periphery of which the brush bristles move in the form of a rim.

The atomization mixing chamber for the two components is situated inside said bell, the supply of the binder and of the pigment being effected in co-axial relationship to the axis of rotation by means of a plurality of inlet nozzles.

Apart from the fact that the coatings of paint are applied and spread or rubbed in the same operation, the technical advance achieved by the invention lies in the fact that the supply points for the binder and the pigment or pigment mixture are arranged inside the bell, that is to say in such manner as to be screened off from the external air. In this way atomization losses are practically eliminated, the respiratory organs of the operating staff are protected, and an intimate mixing of the components inside the bell is effected.

According to the prior art, devices are already known in which the individual coating components are applied to the support by means of a gas subject to excess pressure, for example air. In such a case, the jet of liquid to be atomized surrounds the jet of powder to be atomized. There is no sealing off from the external atmosphere however. It is also known to combine the spraying device and the spreading brush in one apparatus. In this case, however, in comparison with the invention the supply of spreading liquid is effected outside the brush. A common feature of these two earlier constructions is that there are considerable atomization losses and the respiratory organs of the operators are not protected from adverse effects. Similar disadvantages are found in another case in which two spray-guns coupled together are used, one for the binder, the other for the pigment. In this case there is no spreading means such as the brush, and the pigment is introduced by the excess pressure into the binder only on the surface to be protected. This application requires very accurate manipulation since as soon as the binder dries and forms a skin on the said surface the introduction of the pigment can no longer be effected satisfactorily.

In another case the supply of coating substance is effected through the shaft of a brush. This brush, however, performs no rotary movement, the spreading and

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rubbing of the paint being effected as with an ordinary brush by hand.

In comparison with the prior art, the utilization of mechanical energy from the rotary movement in the arrangement according to the invention offers a very considerable technical advance, since the operators have to apply very much less force.

Apart from the mechanical part of the construction, however, and the better utilization of the raw materials as a result of elimination of atomization losses and reduction of the energy expended by the worker, the arrangement according to the invention also affords considerable advantages inasmuch as the mechanical spreading or rubbing of the paint results in a very much more intensive bonding to the surface to which the paint is applied.

This process is further assisted in the device according to the invention inasmuch as a very intimate mixing of the liquid binder with the dry pigment dusts is effected by the bell shape of the application device. All pigment paints have a very great tendency to settle. This disadvantage is completely eliminated with the invention and the concentration or quantitative regulation of the pigment may be effected up to 95%.

Binders and pigments of the most diverse kinds may be used by the process of the invention. The use of the invention is not limited to certain material properties of the binder and pigments. Hereinafter are given a number of examples for the composition of binders and pigments:

Using metals of the kind from which metallic powders can be made it is possible, by means of suitable binders, to produce a metallization on any desired surfaces. In this connection use may be made, for example of zinc, lead, copper, cadmium, nickel, or brass in powder form.

Instead of metallic powders it is also possible to use non-metallic powders, for example rubber, basalt, glass, porcelain, mica, asbestos and similar substances. According to the different requirements of the protective coatings, combinations of different coatings which follow one another and are adapted to one another are also of very great advantage. By way of example, on a steel surface, zinc may be applied in the first instance as cathode protection, and then a coating of glass powder be applied thereto. This combination is particularly important for the protection of steel structures against industrial waste gases. For protection against chemical attacks, a lead priming can be used first, and over that a coating of basalt or glass, a high-grade synthetic resin being used as binder.

Coal-tar colours can be used in similar manner with zinc or lead powder as priming and coatings of silicon carbide thereover as protection against chemical attacks.

The composition of the individual coatings and the combination of a plurality of coatings depend on the particular purpose required, and it has been found particularly advantageous that concentration of the pigments up to 95% relative to the binder is possible. Even with such a high proportion of pigment the films are completely unstressed on the surface, are flexible and do not crack when the coating is subjected to alternating stresses.

In the accompanying drawings, FIG. 1 shows the actual spreading means and FIG. 2 the complete spreading device.

In FIG. 1, reference 1 denotes the housing, which contains the drive for the brush. Reference 2 is the housing for the motor 3, and the gear 4 for the power transmission from the motor to the brush. Reference 5 denotes the bearings for the movable parts. The forms of power transmission and bearings are intended only as examples, and may be embodied in any other manner.

The hollow shaft by means of which the brush is driven is denoted by reference 6. The supply means 7 and 8 for the binder and pigment are taken through the hollow shaft. The annular brush is denoted by reference 9, and 10 indicates a suspension eye, by means of which the device can be suspended as required when in use, so that the operator's hands are freed.

The mode of operation is therefore such that pigment and binder pass into the interior of the annular brush through the supply means 7 and 8 by means of a gas under pressure, for example air, and are spread after being mixed by the brush. The motor housing 2 simultaneously serves as handle for operation.

FIG. 2 shows the complete spraying device. The annular brush 9 is joined fast by its housing to the motor housing 2. Reference 11 is the supply cable for the electric current, which is switched on and off by means of the switch 12. The supply means 7 and 8 for the pigment and binder are connected to the housing 1 by means of hose clips 13, 14. Valves 15 and 16 are provided, one each in the supply means 7 and in the supply means 8, for regulation purposes for the supply and batching of the pigment and binder. Reference 17 denotes a belt, by means of which the operator is relieved of the weight of the supply lines.

The pigment is disposed in the powder mixing container 18, which is equipped with a pressure gauge 19 and a filler screw 20. The binder is disposed in the pressure container 21, which is likewise equipped with a pressure gauge 19.

The binder and pigment are fed by means of a gas under pressure, for example air. This gas is fed to the system at 22 and on the one hand, by way of the reduction valves 23 and 24, is connected to the powder mixing container 18 and the pressure container 21 for the binder and, on the other hand, by way of the pressure line 25 and the reduction valve 16, is connected to the pigment supply.

The apparatus is fed with pressure gas by means of a compressor of any type of construction.

The operator who, as already stated, is relieved of the weight of the supply lines by means of the belt 17, can conveniently carry out the coating operations, since all the supply means consist of elastic material—rubber or synthetic plastic materials.

I claim:

1. An applying device adapted to apply a paint comprising a pigment and a binder, said device comprising: an annular rotatable brush, said brush having bristles and

a head; a housing connected to said brush head, means carried on said housing and operatively connected to rotate said brush; plural separate supply means adapted to contain said pigment and said binder respectively, separate supply conduits operatively connected to said supply means and to said brush, said conduits terminating within the bristles of said brush, for separately feeding said pigment and said binder from said supply means into the inner portion of said rotating brush, whereby desired quantities of said pigment and said binder may be mixed within the brush bristles and applied to a base by contact with said bristles and separate operating controls for said supply conduits.

2. A paint applying device according to claim 1 wherein the means for rotating said brush and said operating controls are disposed in the vicinity of the brush within reach of the operator of said device.

3. A paint applying device according to claim 1 wherein said binder supply means is pressurizable for forcing the binder to said brush in a substantially air-free state.

4. A paint applying device according to claim 3, wherein said pigment supply means is pressurizable for forcing said pigment to said brush and means for feeding additional air under pressure to the supply conduit for said pigment.

5. A method of applying paint wherein separate streams of pigment and binder are separately supplied to the center of a movable rotating annular brush, being thereby mixed within the brush, and wherein the pigment and binder are simultaneously applied to a base by contacting same with the rotating brush.

6. The method of claim 5 wherein the pigment is supplied to said brush as a mixture of pigment and air, and wherein the binder is supplied to said brush in a substantially air-free state.

7. A paint applying device according to claim 1, wherein said pigment supply means is pressurizable for forcing said pigment to said brush and means for feeding additional air under pressure to the supply conduit for said pigment.

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